

# CONTENTS

Abstract .....	1
Introduction .....	2
Description of Study Area.....	4
Topographic Setting .....	4
Geologic Setting .....	4
Climate .....	5
Ground-Water Level Fluctuations .....	5
Water Use .....	8
Streamflow.....	8
Flow-Duration Analysis .....	8
Streamflow-Gaging Stations.....	8
Low-Flow Partial-Record and Discontinued Streamflow-Gaging Stations.....	13
Factors Affecting Streamflow .....	18
Differences in Surface-Water and Ground-Water Drainage Boundaries.....	18
Surficial Deposits .....	18
Wetlands and Water Bodies .....	21
Ground-Water Withdrawals.....	21
Ground-Water Underflow .....	23
Ground-Water Recharge and Discharge .....	27
Recharge.....	27
Discharge.....	28
Characteristics of Surficial Deposits .....	32
Summary .....	37
References Cited .....	38
Appendix A .....	41
Table A1. Discharge measurements made and measurements used in analyses at low-flow partial-record stations and discontinued streamflow-gaging stations in and near Buzzards Bay Basin, southeastern Massachusetts, water years 1965-93.....	43
Appendix B .....	47
Table B1. Descriptions of locations for seismic-refraction survey lines conducted by the U.S. Geological Survey in Buzzards Bay Basin, southeastern Massachusetts .....	49
Figure B1. Geohydrologic sections based on seismic-refraction surveys in Buzzards Bay Basin, southeastern Massachusetts .....	50
Appendix C .....	53
Table C1. Descriptions of locations and water levels in test wells drilled by the U.S. Geological Survey in Buzzards Bay Basin, southeastern Massachusetts, water year 1992 .....	55
Table C2. Descriptions of lithology in test wells drilled by the U.S. Geological Survey in Buzzards Bay Basin, southeastern Massachusetts .....	55
<b>FIGURES</b>	
1,2. Maps showing:	
1. Location of study area, and stratified-drift and till and bedrock deposits in Buzzards Bay Basin, southeastern Massachusetts .....	3
2. Location of streamflow-gaging stations and observation wells in and near Buzzards Bay Basin, southeastern Massachusetts .....	6
3. Hydrographs showing water-level fluctuations for selected observation wells in and near Buzzards Bay Basin, southeastern Massachusetts, 1957-92 .....	7

4. Map showing location of ground-water and surface-water sources used for public-water supplies in Buzzards Bay Basin, southeastern Massachusetts, 1992 .....	11
5. Graph showing flow-duration curves of daily mean discharge per square mile at six streamflow-gaging stations in southeastern Massachusetts and Rhode Island, water years 1967-91 .....	12
6. Map showing location of low-flow partial-record stations and discontinued streamflow-gaging stations in Buzzards Bay Basin, southeastern Massachusetts .....	14
7. Graphs showing stream discharge per square mile equaled or exceeded 50, 70, 90, and 99 percent of the time in relation to percentage of basin underlain by stratified drift in southeastern Massachusetts and Rhode Island, water years 1967-91 .....	22
8. Map showing location of low-flow partial-record stations and public-supply wells along the Paskamanset River and selected tributaries, southeastern Massachusetts .....	24
9. Graphs showing Paskamanset River streamflow by drainage area from stations 01105930 to 01105933 on September 18, 1991, and on July 28 and September 16, 1992.....	26
10. Graphs showing flow-duration curves for stream discharge and ground-water discharge at six streamflow-gaging stations in southeastern Massachusetts and Rhode Island, water years 1967-91 .....	29
11. Map showing locations of areas of changes in saturated thickness of the stratified-drift deposits in Buzzards Bay Basin, southeastern Massachusetts.....	34

## TABLES

1. Water use for municipalities in Buzzards Bay Basin, southeastern Massachusetts, 1986, 1991, and 1992.....	9
2. Descriptions of streamflow-gaging stations in southeastern Massachusetts and Rhode Island used in flow-duration and ground-water recharge and discharge analysis.....	12
3. Descriptions of low-flow partial-record stations and discontinued streamflow-gaging stations in Buzzards Bay Basin, southeastern Massachusetts for which stream discharge estimates are provided .....	15
4. Summary of flow-duration analysis for low-flow partial-record stations and discontinued streamflow-gaging stations in Buzzards Bay Basin, southeastern Massachusetts, water years 1967-91 .....	16
5. Estimated stream discharge at selected flow durations for low-flow partial-record stations and discontinued streamflow-gaging stations in Buzzards Bay Basin, southeastern Massachusetts, water years 1967-91 .....	19
6. Estimated stream discharge per square mile at selected flow durations for low-flow partial-record stations and discontinued streamflow-gaging stations in Buzzards Bay Basin, southeastern Massachusetts, water years 1967-91 .....	20
7. Streamflow and well pumpage on the Paskamanset River, southeastern Massachusetts, and on selected tributaries to the Paskamanset River on September 18, 1991, and on July 28 and September 16, 1992 .....	25
8. Estimates of minimum, maximum, and mean ground-water recharge and discharge rates during water years 1967-91 at six streamflow-gaging stations in southeastern Massachusetts and Rhode Island derived from the computer programs RORA and HYSEP.....	27
9. Streamflow, ground-water discharge, and ratio of ground-water discharge to streamflow at selected flow durations at six streamflow-gaging stations in southeastern Massachusetts and Rhode Island, water years 1967-91.....	30
10. Estimated ground-water discharges at selected flow durations for low-flow partial-record stations and discontinued streamflow-gaging stations in Buzzards Bay Basin, southeastern Massachusetts, water years 1967-91 .....	31
11. Descriptions of locations for areas of changes in characteristics of surficial deposits in Buzzards Bay Basin, southeastern Massachusetts.....	35

## CONVERSION FACTORS AND VERTICAL DATUM

### CONVERSION FACTORS

Multiply	By	To obtain
cubic foot per second ( $\text{ft}^3/\text{s}$ )	0.02832	cubic meter per second
cubic foot per second per square mile [ $(\text{ft}^3/\text{s})\text{mi}^2$ ]	0.01093	cubic meter per second per square kilometer
foot (ft)	0.3048	meter
inch (in.)	25.4	millimeter
inch per year (in/yr)	2.54	centimeter per year
mile (mi)	1.609	kilometer
million gallons per day (Mgal/d)	0.04381	cubic meter per second
square mile ( $\text{mi}^2$ )	2.590	square kilometer
Temperature in degrees Fahrenheit ( $^{\circ}\text{F}$ ) can be converted to degrees Celsius ( $^{\circ}\text{C}$ ) as follows: $^{\circ}\text{C} = 5/9 (^{\circ}\text{F} - 32)$ .		

### VERTICAL DATUM

**Sea Level:** In this report “sea level” refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)--a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

